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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/597,010

04/20/2007

Alexander Schnell

003-239

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36844

7590

06/16/2009

CERMAK KENEALY VAIDYA & NAKAJIMA LLP  
515 E. BRADDOCK RD  
ALEXANDRIA, VA 22314

EXAMINER

MEKHLIN, ELI S

ART UNIT

PAPER NUMBER

1793

NOTIFICATION DATE

DELIVERY MODE

06/16/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ACERMAK@CKVNLaw.COM  
CGOODE@CKVNLaw.COM  
PTADMIN@CKVNLAW.COM

<b>Office Action Summary</b>	<b>Application No.</b> 10/597,010	<b>Applicant(s)</b> SCHNELL ET AL.	
	<b>Examiner</b> ELI MEKHLIN	<b>Art Unit</b> 1793	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 April 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2 and 5-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 5-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/13/2006</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

(1)

This is the second office action on the merits. Claims 1-2 and 5-11 are pending before the Office for review.

(2)

### ***Information Disclosure Statement***

Examiner apologizes for the incorrectly annotated form 1449 in the office action dated December 15, 2008. A properly annotated form 1449 is included with the present action. Examiner fully considered all the references cited in the Information Disclosure Statement submitted on July 13, 2006.

(3)

### ***Response to Arguments***

Applicant's arguments, see Remarks, filed April 15, 2009, with respect to claims 1-2 and 5-11 have been fully considered and are persuasive. The rejection of claims 1-2 and 5-11 has been withdrawn.

Examiner has withdrawn the rejection of claims 1-2 and 5-11 over Stern in view of Hasz. Examiner agrees that Examiner incorrectly interpreted the scope of the claim. The claim language clearly indicates that, due to the transitional phrase 'consisting of,' the claim is closed.

Upon an updated review of the prior art, the following new ground of rejection is being made. Examiner apologizes for this extended prosecution.

(4)

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over SCHNELL et al. (U.S. Publication No. 2003/0066177) in view of BUDINGER et al. (U.S. Patent No. 5,240,491).

With respect to **claim 1**, SCHNELL teaches a braze alloy consisting of 10-15 wt% Cr, 10 wt% Co, 4 wt% W, 2.5-3.5 wt% Ta, 3.0-4.5 wt% Al, 1.6-2.7 wt% B with the balance Ni. Page 2, Paragraph 24, Table 1. These ranges overlap or lie inside the ranges claimed by Applicant, establishing a *prima facie* case of obviousness. See MPEP 2144.05(I). In the configuration taught by SCHNELL, when Cr is 11 wt% and Al is 4.5 wt%, Cr and Al are greater than 15 wt%. When Al is 4.5 wt% and Ta is 3.5 wt%, Al and Ta are greater than 7.5 wt%. Finally, when Cr is 11 wt% and Al is 4.5 wt%, Cr/Al is less than or equal to 3.

SCHNELL is silent as to whether the braze alloy can also contain yttrium in a wt% range of 0.17 to 0.3%.

However, BUDINGER, which deals with braze alloy powders, teaches a braze alloy that has, in one variation, a composition of cobalt, chromium, aluminum, tantalum, tungsten, boron and yttrium in a nickel base with impurities. Col. 11-12, Claim 1. Specifically, BUDINGER teaches embodiments that have 0.2 wt% or 0.3 wt% yttrium. Col. 9-10, Tables I and II. Variations of the braze alloy composition taught by

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BUDINGER lead to an alloy where Cr and Al is greater than 15, Cr/Al is less than or equal to 3 and Al and Ta is greater than 7.5. Col. 9-10, Tables I and II.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of invention to use a braze alloy with a yttrium content of 0.17 to 0.3 wt% because BUDINGER teaches that such a component can be successfully used in braze alloys. Specifically, a person having ordinary skill in the art would appreciate that adding yttrium to such an alloy would improve the oxidation resistance of the alloy.

With respect to **claim 2**, SCHNELL teaches that the braze alloy is braze single crystal articles made from Nickel based super alloys. Paragraph 7.

With respect to **claim 5**, SCHNELL teaches that the single crystal article can be a gas turbine component. Paragraph 22.

(5)

Claims 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over SCHNELL et al. (U.S. Publication No. 2003/0066177) in view of BUDINGER et al. (U.S. Patent No. 5,240,491) as applied to claims 1-2 and 5 above, and further in view of STERN (U.S. Patent No. 4,507,264).

With respect to **claim 6**, SCHNELL and BUDINGER, as combined above, are silent as to whether the braze alloy is in the form of a paste, foil, an ingredient in a blend braze paste, tape, or pre-sintered sheet.

However, STERN, which deals with brazing methods, teaches a method of brazing that includes applying the brazing alloy in paste form to a super-alloy joint,

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heating the joint to the brazing temperature in a vacuum furnace, followed by a post-braze heat treatment. Col. 6, Lines 1-8.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of invention to use the braze alloy in a paste form because STERN teaches that such a physical configuration of the braze alloy allows for effective brazing. Additionally, a person having ordinary skill in the art would appreciate that a braze alloy paste is particularly suited for brazing a joint, which is how STERN uses the braze alloy in paste form.

With respect to **claim 10**, STERN teaches that the braze alloy, in paste form, is applied to a super-alloy article joint and the joint is heated to the brazing temperature in a vacuum furnace, followed by a post-braze heat treatment. Col. 6, Lines 1-8. STERN does not state that the braze paste is mixed with any other additive. Additionally, STERN teaches that the braze temperature can be as high as 2150° C. Claim 3. STERN teaches that the braze alloy is particularly suitable for brazing nickel-based super-alloy articles. Col. 2, Line 1.

(6)

Claims 7-8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over SCHNELL et al. (U.S. Publication No. 2003/0066177) in view of BUDINGER et al. (U.S. Patent No. 5,240,491) as applied to claims 1-2 and 5 above, and further in view of STERN (U.S. Patent No. 4,507,264) and SCHAEFER et al. (U.S. Patent No. 5,806,751).

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With respect to **claim 7**, SCHNELL and BUDINGER, as combined above, teach that the braze alloy can be used to braze super-alloy articles but are silent as to the braze alloy's physical form and whether filler material is used.

However, SCHAEFER, which deals with methods of repairing gas turbine components, teaches that it is difficult to use a brazing alloy, absent a filler material, to braze large defects in gas turbine components. Col. 1, Lines 32-35. SCHAEFER teaches that it is known in the art to use metallic alloy filler with a braze alloy to affect the repair of large defects. Col. 1, Lines 42-43. The metallic alloy filler has a composition similar to the material the metallic alloy article that is being repaired, which in this case is a nickel or cobalt based super-alloy. Col. 2, Lines 20-21.

Additionally, with respect to the physical configuration of the braze alloy, STERN, as explained above, teaches that the braze alloy, when in paste form, can be effectively used to braze super-alloy articles. Col. 6, Lines 1-8.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of invention to use a braze paste and combine it with a filler consisting of cobalt or nickel super-alloy because SCHAEFER teaches that metallic filler, with a composition substantially similar to the article to be brazed, can be combined with a braze alloy to form a braze product and that such a braze product can more effectively repair large defects in nickel or cobalt-based super-alloy articles. Additionally, STERN teaches that braze pastes can be effectively used to braze, i.e. repair super-alloy articles.

With respect to **claim 8**, SCHAEFER teaches that the braze alloy, the second metallic filler material, is between 0 to 40 wt% of the entire braze product. Col. 2, Lines 31-37. This range completely covers the claimed range of 0 to 30 wt%. Where the claimed ranges overlap or lie inside ranges disclosed by the prior art, a *prima facie* case of obviousness exists. *In re Woodruff*, 919 F.2d 1575 (Fed. Cir. 1990).

With respect to **claim 11**, SCHNELL, BUDINGER, STERN and SCHAEFER, as combined above, teach that the braze product, which is a braze paste and a metallic filler wherein the metallic filler has the same composition of the article to be brazed, can be used to braze a nickel or cobalt-based super-alloy article, such as a gas turbine component. SCHAEFER, Col. 1, Lines 11-42.

(7)

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over SCHNELL et al. (U.S. Publication No. 2003/0066177) in view of BUDINGER et al. (U.S. Patent No. 5,240,491), STERN (U.S. Patent No. 4, 507,264) and SCHAEFER et al (U.S. Patent No. 5,806,751) as applied to claims 7-8 and 11, and further in view of VAN ESCH (U.S. 6,575,349) and RAFFERTY (U.S. Patent No. 6,612,480).

With respect to **claim 9**, SCHNELL, BUDINGER, SCHAEGER and STERN, as combined above, are silent as to whether a pre-sintered braze sheet having no binder is used as a brazing product.

However, VAN ESCH, which deals with a method of applying braze to a substrate, teaches that pre-sintering braze products reduces the need for binder and/or adhesive and produces a better braze. Col. 1, Lines 60-65. Additionally, RAFFERTY



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teaches that a pre-sintered braze sheet (preform) is a highly effective technique that can be used to braze a product. Col. 1, Lines 45-50.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of invention to use a pre-sintered braze sheet because VAN ESCH teaches that pre-sintering eliminates the need for binder and produces a better braze and RAFFERTY teaches that a preform, which can be a sheet, is a highly effective brazing technique.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELI MEKHLIN whose telephone number is (571)270-7597. The examiner can normally be reached on 5/4/9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ELI MEKHLIN/  
Examiner, Art Unit 1793

/J.A. LORENZO/  
Supervisory Patent Examiner, Art  
Unit 1793